

1           21.    A method of analyzing a power line to increase the power handling  
2 capability of the power line comprising:

3           providing data of an existing power line configured to transmit electrical  
4 energy, the existing power line being configured according to initial design parameters  
5 and comprising a conductor supported by a plurality of supports;

6           providing a first model of the existing power line configured according to the  
7 initial design parameters using the data;

8           analyzing the first model of the existing power line at an increased operating  
9 condition to identify a violation of the conductor responsive to the increased  
10 operating condition; and

11          after the analyzing, altering the initial design parameters to provide a second  
12 model of the existing power line configured according to modified design parameters  
13 different than the initial design parameters provide a design having increased power  
14 handling capability of the conductor.

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16          22.    The method according to claim 21 wherein the providing data  
17 comprises providing data of the existing power line configured according to the initial  
18 design parameters comprising a location of at least one clamp relative to the  
19 conductor, and wherein the altering comprises altering the position of the at least one  
20 clamp relative to the conductor.

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22          23.    The method according to claim 22 wherein the altering the position  
23 comprises altering to avoid at least one of a clearance violation and a swing violation.  
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1           24.    The method according to claim 21 wherein the altering comprises  
2 removing a portion of the conductor.

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4           25.    The method according to claim 21 wherein the providing the first model  
5 comprises analyzing the position of insulators relative to the conductor to resolve  
6 forces exerted upon the insulators in a static equilibrium state to determine  
7 equilibrium points of a plural span system.

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9           26.    The method according to claim 21 wherein the providing the first model  
10 comprises analyzing movement of insulators coupled with the conductor and stiffness  
11 of individual supports.

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13           27.    The method according to claim 21 wherein the providing data  
14 comprises providing data of a plurality of spans of the existing power line, and the  
15 altering comprises altering individual ones of the spans.

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17           28.    The method according to claim 21 wherein the providing data  
18 comprises providing data of a plurality of spans of the existing power line, and the  
19 providing the first model comprises providing equilibrium points for the spans.

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21           29.    The method according to claim 21 wherein the providing data  
22 comprises providing data of a plurality of spans of the existing power line, and the  
23 providing the first model comprises distributing error throughout the existing power  
24 line to provide a steady state first model.

1           30. The method according to claim 21 wherein the providing data  
2 comprises providing data of a plurality of spans of the existing power line, and the  
3 altering comprises altering a span having a violation.

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5           31. The method according to claim 21 wherein the providing data  
6 comprises providing data of a plurality of spans of the existing power line, and the  
7 altering comprises altering a span adjacent to another span having a violation.

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9           32. The method according to claim 31 wherein the altering comprises  
10 altering the span adjacent the another span having a tension violation.

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12           33. The method according to claim 21 wherein the providing the  
13 first model comprises providing without use of the Ruling Span concept.

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15           34. The method according to claim 21 wherein the providing data  
16 comprises providing data of the existing power line according to initial design  
17 parameters comprising original design parameters.

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19           35. The method according to claim 21 wherein the providing data  
20 comprises providing data of the existing power line using survey information obtained  
21 from the existing power line in the field.

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23           36. The method according to claim 21 further comprising analyzing the  
24 second model of the existing power line at an increased operation condition.

1           37.    The method according to claim 21 further comprising analyzing the  
2 second model with respect to current safety code.

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4           38.    A method of analyzing a power line to increase the power handling  
5 capability of the power line comprising:

6           providing data of an existing power line configured to transmit electrical  
7 energy, the existing power line being configured according to initial design parameters  
8 and comprising a conductor coupled with a plurality of insulators and supported by  
9 a plurality of supports defining a plurality of spans;

10          providing a first model of the existing power line configured according to the  
11 initial design parameters using the data, the providing the first model comprising  
12 providing a steady state first model of the existing power line including resolving  
13 forces in a static equilibrium calculation;

14          analyzing the first model of the existing power line at an increased operating  
15 condition to identify a violation of the conductor responsive to the increased  
16 operating condition;

17          after the analyzing, altering the initial design parameters to provide a second  
18 model of the existing power line configured according to modified design parameters  
19 different than the initial design parameters to provide a design having increased  
20 power handling capability of the conductor, wherein the altering comprises at least  
21 one of adjusting a location of clamp relative to the conductor and removing a portion  
22 of the conductor; and

23          analyzing the second model of the existing power line at an increased  
24 operating condition.

1           39. The method according to claim 38 wherein the providing data  
2 comprises providing data of the existing power line according to initial design  
3 parameters comprising original design parameters.

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5           40. A computer configured to perform steps comprising:  
6           receiving data of an existing power line configured to transmit electrical  
7 energy, the existing power line being configured according to initial design parameters  
8 and comprising a conductor supported by a plurality of supports;

9           providing a first model of the existing power line configured according to the  
10 initial design parameters using the data;

11          analyzing the first model of the existing power line at an increased operating  
12 condition to identify a violation of the conductor responsive to the increased  
13 operating condition; and

14          after the analyzing, altering the initial design parameters to provide a second  
15 model of the existing power line configured according to modified design parameters  
16 different than the initial design parameters to provide a design having increased  
17 power handling capability of the conductor.